Schedule

Week 1 (09/07-9/11)

- Day 1
  - Introduction to Theory of Computation[1]
  - Introduction to OCAML[2]
  - Assignment 1[3]
- Day 2
  - OCAML basics[4]
- Day 3
  - OCAML basics (cont)[5]
- Day 4
  - OCAML basics (cont)[6]
  - OCAML example: sets as lists (optional)[7]

Week 2 (09/14-09/18)

- Day 1
  - Alphabets, strings, substrings, empty string, lexicographic ordering[8]
  - Alphabet and friends in OCAML[9]
  - Assignment 2[10]
- Day 2
  - Languages, examples, constructions[11]
- Day 3
  - Languages, examples, constructions[12]
- Day 4
  - Deterministic Finite Automata[13]

[1] notes/theory_intro.html
[2] notes/ocaml_intro.html
[3] assignments/1.html
[4] notes/ocaml_basics.html
[5] notes/ocaml_basics.html
[6] notes/ocaml_basics.html
[7] notes/ocaml_sets.html
[8] notes/alphabet.html
[9] notes/ocaml_alphabet.html
[10] assignments/2.html
[11] notes/languages.html
[12] notes/languages.html
[13] notes/fin_aut_dfa.html

Week 3 (09/21-09/25)

- Day 1
  - Deterministic Finite Automata (cont)[14]
- Day 2
  - DFAs in OCAML[15]
- Day 3
  - Regular Languages[16]
  - Union of regular languages is regular[17]
- Day 4
  - Implementation of union in OCAML[18]
  - Assignment 3[19]

Week 4 (09/28-10/02)

- Day 1
  - Non-deterministic automata, examples[20]
  - Implementation in OCAML
- Day 2
  - DFA equivalent to an NFA[21]
- Day 3
  - Regular Expressions[22]
  - RegEx -> NFA
- Day 4
  - Nonregular languages and the Pumping Lemma[23]
  - Assignment 4[24]
  - Catching up

[14] notes/fin_aut_dfa.html
[15] notes/ocaml_dfa.html
[16] notes/fin_aut_dfa.html
[17] notes/fin_aut_dfa.html
[18] notes/ocaml_dfa.html
[19] assignments/3.html
[20] notes/fin_aut_nfas.html
[21] notes/fin_aut_nfas.html
[22] notes/regexp.html
[23] notes/nonregular.html
[24] assignments/4.html

Week 5 (10/05-10/09)

- Day 1
  - Lexers[25]
- Day 2
  - Context Free Grammars[26]
  - Examples of derivations
- Day 3
  - Midterm 1 (study guide[27])
- Day 4
  - Programming examples of CFGs
  - Ambiguous grammars

Week 6 (10/12-10/16)

- Day 1
  - Chomsky Normal Forms
- Day 2
  - Pushdown Automata definition[28]
- Day 3
  - PDAs more examples
  - CFG -> PDA[29]
- Day 4
  - PDA -> CFG[30]

Week 7 (10/19-10/23)

- Day 1
  - Fall Break
- Day 2

[25] notes/lexers.html
[26] notes/cfg.html
[27] notes/midterm1_study_guide.html
[28] notes/pushdown_automata.html
[29] notes/cfg_pda.html
[30] notes/cfg_pda.html

  - Pumping lemma for CFGs[31]
  - Non-context-free grammars
- Day 3
  - Basics of Parsing, First/Follow sets[32]
- Day 4
  - Basics of Parsing, LL(k) parsers[33]

Week 8 (10/26-10/30)

- Day 1
  - Basics of Parsing, LR(k) parsers[34]
- Day 2
  - yacc
- Day 3
  - Turing Machines
- Day 4
  - Turing Recognizable vs Turing Decidable languages

Week 9 (11/02-11/06)

- Day 1
  - Multitape / Nondeterministic Turing machines
- Day 2
  - The Church-Turing thesis, algorithms
- Day 3
  - Catching up
- Day 4
  - Midterm 2

[31] notes/pumping_cfg.html
[32] notes/parsing.html
[33] notes/parsing.html
[34] notes/parsing.html

Week 10 (11/09-11/13)

- Day 1
  - Decidable Problems, for regular languages
- Day 2
  - The Halting Problem
- Day 3
  - Undecidability of Halting Problem
- Day 4
  - Reducibility

Week 11 (11/16-11/20)

- Day 1
  - Regularity of languages is undecidable
- Day 2
  - Time Complexity classes
- Day 3
  - The class P
- Day 4
  - The class NP

Week 12 (11/23-11/27)

- Day 1
  - P vs NP, NP-complete problems
- Day 2
  - Thanksgiving Break
- Day 3
  - Thanksgiving Break
- Day 4
  - Thanksgiving Break

Week 13 (12/01-12/04)

- Day 1
- Day 2
- Day 3
- Day 4

Week 14 (12/07-12/11)

- Day 1
- Day 2
- Day 3
- Day 4